

In Parallel

Grace Weir¹

Inscriptions

– contemporary thinking on art,
philosophy and psycho-analysis –
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2017, HDV 17'19"

The film 'In Parallel' begins with the drawing of a straight line and is an exploration of Euclid's Elements, a geometry book written c.300BC. Second only to the Bible in the number of editions published on the invention of the printing press, it has been influential in both mathematics and philosophy through the axiomatic structures that Euclid's work introduced.

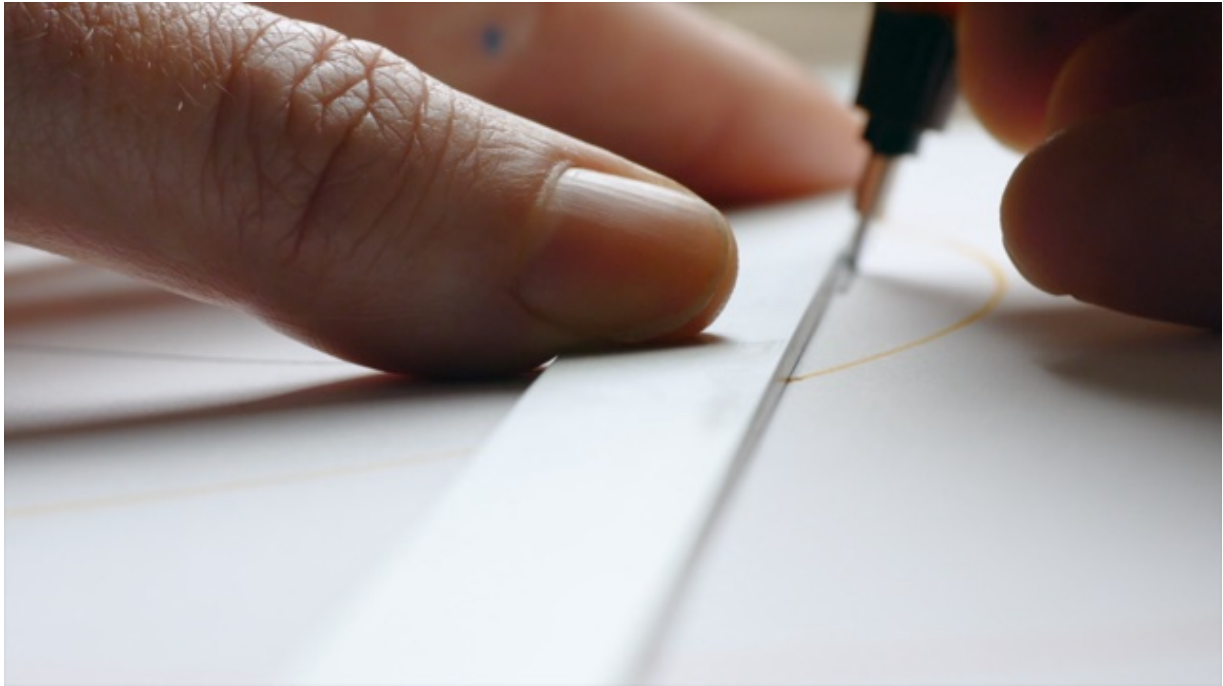
Referencing a particular edition by Oliver Byrne published in 1847 that involved for the first time a graphic conception, the film considers the history of the concept of a parallel line. Through a sequence of coloured drawn geometrical propositions including the vanishing point of linear perspective, the film reflects on how the shapes of thought in which our beliefs are expressed affect our perception of ourselves within our environment.

Commissioned by the Irish Museum of Modern Art for 'As Above, So Below: Portals, Visions, Spirits & Mystics'.



Grace Weir represented Ireland at the 49th International Venice Biennale and has exhibited widely nationally and internationally. She was an Artist-in-Residence in Trinity College Dublin (2012–2015) and had a major solo exhibition at the Irish Museum of Modern Art (2015–2016). In 2019 she was commissioned by The Institute of Physics (UK and Ireland) to create an installation 'Time Tries All Things' for the inaugural show in the Gallery at the Institute of Physics in London.

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In Parallel

3 centuries before the birth of Christ, Euclid defines the properties of points, lines and planes in a series of books called *The Elements*. He inscribes on scrolls made of papyrus, a tall reed growing in the marshy areas along the river Nile.

A point is that which has no part.

A line is a breadth-less length

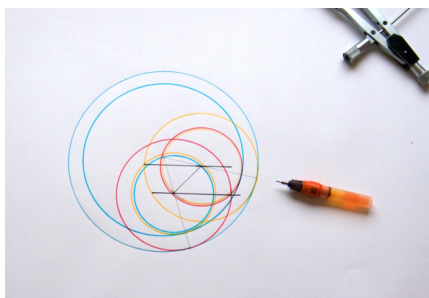
A straight line is a line which lies evenly with the points on itself.

The extremities of a line are points.

The extremities of a surface are lines.

A plane surface is one which lies evenly with the lines on it.

Let it be granted that a circle may be described from any point, at any distance from that point.



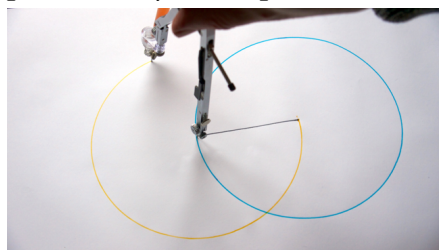
A circle is a figure on a plane, bounded by one continued line, called its circumference and having a certain point within it, from which all straight lines drawn to its centre are equal. This point from which all equal lines radiate is called the centre of the circle. A dominion where communication radiates from a central source to the outskirts or frontiers.

A geometer, an Earth measurer, Euclid lives in Alexandria, in Egypt, a city founded by Alexander the Great, to rival Athens as a centre of learning in the ancient world. On the Mediterranean

coast, the wooden ships that glide into its harbour are compelled to surrender all books for copying into Alexandria's vast library.

Connected to the physical world, geometry develops partly through the surveying of fields after the flooding of the Nile for the purposes of taxation. Euclid presents an ideal axiomatic form, in which propositions could be proven through a small set of statements that are accepted as true.

Let it be granted that a straight line may be drawn from any one point to any other point.



On a given straight line and using only a compass and a straight edge that has no markings, to describe a perfect equilateral triangle.

This line is the radius of the yellow circle. But this line is the radius of the red circle too.

The whole is greater than its parts.

It must have been a beautiful park when Plato, began his informal gatherings on a common ground of olive trees. Over the park's entrance a sign reads "Let no man enter who is ignorant of geometry".

Given a straight line and a point not on it, to draw a line through the point parallel to the straight line .

A line is determined uniquely by any two points through which it passes. Likewise a point is determined uniquely by any two lines which pass through it.

The meeting and joining of points and lines.

Copied by hand, ruminated over centuries, translated into many languages, Euclid's ancient Greek mathematics returns to the West enriched by Arabic contributions.

Rivalling the Bible in the number of editions published, on the invention of the printing press in the 15th century.

The word 'element' is the same as 'letter' in the Greek language.

Conceptualising space into a three dimensional world, a system of perfection and certainty. Statements that are so obviously true and necessary as to be acceptable without proof. A doctrine of logic gnawing at the mind for over two millennia.



Given a line and a point, only one line can run parallel to the given line, through the point.

Converging lines must meet eventually, if in a region beyond the reach of possible observation or geometrical intuition. We hold this truth to be self-evident. This is the necessary assumption upon which the rest is built.

But the line running alongside another evaded the black and

white constraints of the tongue.

Forming a darkness at the heart of geometry. Wearing away at life, those seeking to prove it.

“It is necessary that I still dream.” Something that must be true but proved impossible to demonstrate.

In Hungary in the early 19th century, Farkas Bolyai writes to his son János,



“I wanted to know about parallel lines. I remain ignorant. You must not attempt an approach to parallels, I know this way to its very end. I turned back when I saw that no man can reach the bottom of this night. I turned back uncon-

soled, pitying myself and all mankind. This has taken all the flower of my life and all my time from me.”

The equal sign is represented as two parallel lines by Robert Recorde in England in 1557, “because no two things can be more equal”.

Thinking that he would show that the alternative was absurd, the son came to realise that the failure to prove it might arise because it simply was not true. And János replies, “I do not yet have it but I have discovered such magnificent things that I am myself astonished at them. It would be damage eternal if they were lost. Out of nothing I have created a wholly strange new world.”

Abandon the singular line that can run in parallel to only one other and other consistent realms transpire.

Separating from physical reality, repudiating nature in favour of abstraction, the objects of geometry are no longer to be found in the physical world. They are pure abstractions, creations of the human mind. Freeing geometry from the constraints of our three dimensional world, sending it into new worlds of which Euclid never dreamed.

Transforming points, lines and planes from a concern with magnitude to a consideration of relationships, whether real or abstract.

A line on a plane meeting another line previously distant. The curvature comes not from the thing drawn but rather from the surface upon which it is drawn. There are types of space-formation, not a single universal space given once and for all.

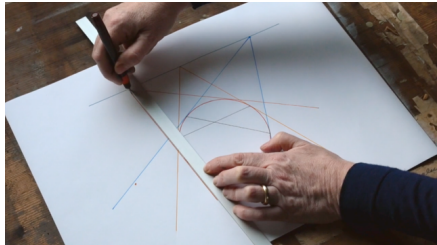


The horizon is a line that separates the earth from the sky, a line that divides all directions into those that intersect with the Earth's surface, and those that do not.

Looking at the work of artists in the 15th century, geometers explore the practical principles of linear perspective. On a picture

plane, all lines running in parallel converge into a vanishing point. A place representing objects shrunk in the distance, to the infinitesimal thickness of a point on a horizon. The vanishing point at infinity, the ideal counterpart of the infinite plane on which Euclidean space depends.

A circle could be viewed as a never ending curve. One can move along it and never come to an end, yet it is not infinite in the usual sense of being boundless in space.



If two tangents are drawn from a point in order to touch a circle, then a line can be drawn joining the two points of tangency. Taken from the geometry of the Earth where the great circle of the equator is obtained by the North or South pole, the

line is called the polar of the point and the point is the pole of the line. One can speak of a pole and it's polar line as having a duality.

An interchangeability between a point and line.

Arising from the study of perspective, instrumental in leading geometry away from its numerical heritage to the study of interconnections and incidences. The dual of three points on a line is three lines meeting in a point, and conversely the duality of three lines meeting in a point is three points meeting on a line.

The creation of forms within this geometry is not dependent on any kind of measurement, but is concerned primarily with relationships between entities. And an all-pervading element of movement within the mutual equivalence of point and plane. A property more fundamental than even Euclid dared. An ever-moving, fluid continuum of projective possibilities, containing the seeds or potentialities of all types of form.

In the familiar one-fold space of the material world, the Absolute is infinitely distant and unattainable. Through the perspective of non-Euclidean geometry, the universe may more adequately be seen as three-fold, material and spiritual, external and internal, with life sustained between these polar realms.



In the Bible, it was an olive leaf that a dove brought back to Noah to demonstrate that the flooding was over.

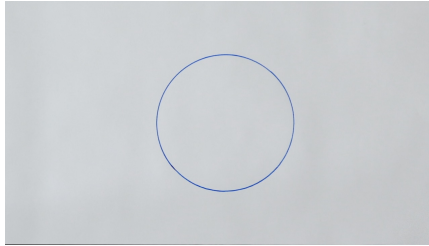
Within the groves of olive trees that grow along the shores of the Mediterranean, some trees have sprouted shoots for over two millennia, still growing since Plato's circle paused within their shade. The leaves of the olive tree are arranged along the stem in pairs, each pair at right angles to the one above or below it. Generating from an infinitude somewhere within, while the outermost leaves gesture to the planar space of Euclid.

There are polarities which interplay and interweave creating the

diverse forms of life, flowers, leaf buds and the human heart.

A point on a plane and a plane emanating from a point.

In writing to signify silence, to pause within the flow of speech. A form between the past and the shape of things to come.



A revolution created by movement and the destruction of the self contained repose of the individual point.

Beginning and end flow into each other and in the same instant separation disappears without a trace.

Nature reveals how spaces of this kind come into being and pass away again.

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